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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/646,073	08/22/2003	David R. Shafer	KLAC0076	8450

30438 7590 08/02/2006

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EXAMINER

PRITCHETT, JOSHUA L

ART UNIT	PAPER NUMBER
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2872

DATE MAILED: 08/02/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/646,073	Applicant(s) SHAHER ET AL.	
	Examiner Joshua L. Pritchett	Art Unit 2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 May 2006.
 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 43-99 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) ☐ Claim(s) _____ is/are allowed.
 6) ☒ Claim(s) 43-99 is/are rejected.
 7) ☐ Claim(s) _____ is/are objected to.
 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
 10) ☒ The drawing(s) filed on 8/22/03 & 10/21/05 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This action is in response to Request for Continued Examination and Amendment filed May 30, 2006 in which claims 43, 49, 61 and 65 were amended as requested by applicant.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 43-51, 53-74, 76-86 and 88-99 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shafer (US 2001/0040722) in view of Yonekubo (US 4,108,794) and Allan (US 6,785,051).

Regarding claims 43, 46, 50-51, 53-55, 57, 59, 63, 65, 69, 73, 74, 76-78, 81, 85-86, 88-90, 92, 94 and 98, Shafer teaches an objective (fig. 3) constructed of a single glass material (page 6, section [0082]) for use with light energy having a wavelength in the range of approximately 157 nanometers through the infrared light range (page 6, section [0082]), comprising: at least one focusing lens (308) having diameter less than approximately 100 millimeters (fig. 3) receiving said light energy and transmitting focused light energy; at least one field lens (304 or 307)

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having diameter less than approximately 100 millimeters (fig. 3), receiving said focused light energy and transmitting intermediate light energy; and at least one Mangin mirror element (306), which is an optical element, having diameter less than 100 millimeters (fig. 3) receiving said intermediate light energy and providing controlled light energy to a specimen (309, not shown); wherein the objective is optimized to produce minimum spherical aberration, axial color, and chromatic variation of aberrations (page 7, sections [0083]-[0085]); wherein the at least one Mangin mirror element is optimized to produce spherical, axial color, and chromatic variation of aberrations to compensate for aberrations induced by the focusing lens group (page 6, section [0081]); wherein each lens used in the objective has a diameter of less than approximately 25 millimeters (fig. 3); wherein said objective is configured to provide broadband imaging while receiving light energy at wavelengths less than 400 nm (see at least the abstract); and wherein said at least one Mangin mirror element (306) comprises a single lens/mirror element comprising substantially curved concave surface (top surface in figure); and a second minimally curved surface (bottom surface in figure). Shafer lacks the controlled light energy going through an immersion substance to the specimen and the Mangin mirror element receiving said intermediate light energy from a front side through a back/rear side thereof; and wherein both surfaces of the single lens/mirror element are reflective with small central apertures through which light energy may pass. Yonekubo teaches using an immersion substance, including water and oil, to obtain better imaging performance (columns 1-2). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a well known immersion substance with the objective of Shafer as taught by Yonekubo to provide better imaging performance because of reduced reflections due to the index matching provided by the immersion substance. Further,

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Allan teaches an objective (fig. 2) with at least one Mangin mirror element comprises a single lens/mirror element (60) comprising substantially curved concave surface (fig. 2); and a second minimally curved surface (fig. 2) wherein both surfaces of the single lens/mirror element are reflective with small central apertures through which light energy may pass (column 7, lines 22-34). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the Mangin mirror of Shafer a double-reflecting one with central apertures as suggested by Allan to be able to make a more compact objective configuration by negating the need for the light to be reflected out of the optical path and back into the optical path as shown in Shafer Fig. 3. Therefore the Mangin mirror element will receive said intermediate light energy through a back/rear side thereof.

Regarding claims 49, 61-62, 72, 84 and 96-97, Shafer teaches in fig. 9 an objective for use with light energy having a wavelength in the range of approximately 157 nanometers through the infrared light range with field and focusing lenses and a Mangin mirror element less than approximately 100 millimeters (fig. 9) wherein only two glass materials are used (see table 5) comprising fused silica and calcium fluoride (see table 5). Shafer lacks the controlled light energy going through an immersion substance to the specimen and said Mangin mirror element receiving said intermediate light energy through a back/rear side thereof. Immersion substances, including water and oil are well known in the microscope/lithography art to obtain better imaging performance. Yonekubo teaches using an immersion substance, including water and oil, to obtain better imaging performance (columns 1-2). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a well known immersion substance with the objective of Shafer as taught by Yonekubo to provide better imaging

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performance. Further, Allan teaches an objective (fig. 2) with at least one Mangin mirror element including small central apertures through which light energy may pass (column 7, lines 22-34). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the Mangin mirror of Shafer a double-reflecting one with central apertures as suggested by Allan to be able to make a more compact objective configuration. Therefore the Mangin mirror element will receive said intermediate light energy through a back/rear side thereof.

Regarding claims 58 and 93, Shafer teaches said objective (fig. 3) having a numerical aperture of greater than approximately 1.0 at the specimen (page 7, section [0085]).

Regarding claims 44-45, 56, 66-68, 64, 79-80, 91 and 99, Shafer in view of Yonekubo and Allan as set forth above disclose the claimed invention except for wherein said objective has a field size of approximately 0.15 mm and a numerical aperture of approximately 1.2. It would have been obvious to one having ordinary skill in the art at the time the invention was made to make objective have a field size of approximately 0.15 mm and a numerical aperture of approximately 1.2, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. One would have been motivated to have the objective have a field size of approximately 0.15 mm and a numerical aperture of approximately 1.2 for the purpose of providing a larger field of view. *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977) See also *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claims 47-48, 60, 70, 71, 82, 83 and 95, Shafer in view of Yonekubo and Allan as set forth above further disclose said objective having a long working distance used with a microscope (Shafer, figs. 1 and 2) having a flange (at 102 or 202) but is silent as to the location of the flange being approximately 45 millimeters from the specimen during normal operation or

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at least approximately 100 millimeters from the specimen during normal operation. It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the flange be approximately 45 millimeters from the specimen during normal operation or at least approximately 100 millimeters from the specimen during normal operation, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. One would have been motivated to have the flange be approximately 45 millimeters from the specimen during normal operation or at least approximately 100 millimeters from the specimen during normal operation for the purpose of having an appropriate working area for interacting with/changing the specimen. *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977) See also *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Claims 52, 75 and 87 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shafer et al. in view of Yonekubo and Allan as applied to claims 43, 66 and 78 above and further in view Deutsch et al., WO 01/57563 A2.

Shafer in view of Yonekubo and Allan as applied to claims 43 and 78 above disclose the claimed invention except for the immersion substance being a silicone gel. Deutsch teaches using a silicone gel as an immersion substance (page 2, lines 18-20). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the immersion substance of Shafer in combination with Yonekubo and Allan be a silicone gel as suggested by Deutsch et al. to provide more controllable flow characteristics to the immersion substance

Response to Arguments

Applicant's arguments filed May 30, 2006 have been fully considered but they are not persuasive.

Applicant argues on page 13, the device formed by the combination Shafer, Yonekubo and Allan would be a poor image and inadequate inspection in the environment claimed. The prior art combination teaches all the structural limitations of the claimed invention and therefore would perform the functional limitations to the standards of claimed invention. The applicant states the immersion substances taught by Yonekubo do not indicate use in the 157 nm to infrared wavelength range. Water is capable of transmitting light in both the UV and IR wavelength ranges. Therefore absent some other limitation on the immersion substance the prior art satisfies the claimed limitations.

Applicant argues on page 13, the light energy does not enter the back side of the mangin mirror of Shafer. The claim language provides no point from which to determine which surface "a back side" must refer. Therefore the examiner's interpretation is reasonable based on the claim language. The examiner points out this limitation has been amended to now require the light to pass completely through (from a back side through to a front side) which is taught by Allan as stated in the rejection above.

Applicant argues on page 14, it is unclear what type of objective would result from a mangin mirror wherein light energy passes through a back side thereof in a design such as Shafer however it is unlikely to provide any type of usable inspection system. The applicant presents no evidence that the combination does not work and the statement that the system would not be usable is a mere conclusion without any evidence provided as support.

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Applicant argues on page 14, these reference are materially diverse and each reference does not suggest employing the features disclosed in any of the other references. The reference does not have to explicitly provide a suggestion for combination. It is extremely well known in the art that immersion substances are used to provide refractive index matching between an objective and a specimen to prevent reflections at interfaces due to large refractive index differences. The knowledge of one of ordinary skill in the art can be used as a suggestion and motivation to combine references to form a proper rejection.

Applicant argues on page 15, the stated motivation to combine Shafer and Yonekubo of providing better image performance is not a motivation but a conclusory statement. The motivation to combine comes from the knowledge of one of ordinary skill in the art that immersion substances can reduce reflections that produce unwanted glare that obscure and deteriorate the image provided to the observer.

Applicant argues on page 16, the motivation to combine Shafer and Allan of creating a more compact objective configuration is a conclusory statement and without any support. If the mangin mirror of Allan were combined into the Shafer reference the new combination would be more compact than Shafer because the light would not have to have along the path perpendicular to the axis between elements 301 and 308 to go through the mangin mirror. Instead the mangin mirror could be placed along the axis between 301 and 308, thus making the system more compact.

Applicant argues on pages 16-18, the examiner used hindsight to construct the rejection. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a

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sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Applicant argues on page 19, the issue is whether the references as a whole suggest the particular combination being used to rejection the claims. The references are read in light of the knowledge of one of ordinary skill in the art therefore the references as a whole include the knowledge of one of ordinary skill in the art. As stated above the motivations for the combinations provided come from the knowledge of one of ordinary skill in the art. Therefore the rejections are proper.

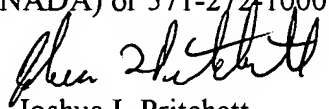
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joshua L. Pritchett whose telephone number is 571-272-2318. The examiner can normally be reached on Monday - Friday 7:00 - 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew A. Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Joshua L Pritchett

Examiner

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